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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,039	12/30/2003	Steven K. Reinhardt	42P17403	9187

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EXAMINER

GEIB, BENJAMIN P

ART UNIT	PAPER NUMBER
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2181

MAIL DATE	DELIVERY MODE
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11/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/750,039

Applicant(s)

REINHARDT ET AL.

Examiner

Benjamin P. Geib

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment as received on 09/07/2007.

Claim Objections

2. Applicant, via amendment, has overcome the claim objections set forth in the previous Office Action. Consequently, the examiner has withdrawn these objections.

Claim Rejections - 35 USC § 112

3. Applicant, via amendment, has overcome the 35 U.S.C. § 112, second paragraph, rejections set forth in the previous Office Action except for the rejections for claims 5 and 7 regarding the limitations "means for committing a single set of thread" and "wherein each epoch is executed twice", respectively. Consequently, the examiner has withdrawn the rejections that have been overcome and maintains those regarding claims 5 and 7 that have not been overcome.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5-8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 5 recites the limitation "means for committing a single set of thread". This limitation renders the claim indefinite as it is unclear to the examiner how a "set of

thread” can committed. The limitation “means for committing a single set of thread” will be interpreted as “means for committing a single set of instructions” as this appears to be what applicant intended as indicated by a similar limitation in independent claim 1.

7. Claim 7 recites the limitation “wherein each epoch is executed twice”. As there is no previous mention of epochs in the claim, there is insufficient antecedent basis for this limitation in the claim. The limitation “wherein each epoch is executed twice” will be interpreted as “wherein epochs are executed twice” for the remainder of the examination as this appears to be what applicant intended.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Vijaykumar et al., “Transient-Fault Recovery Using Simultaneous Multithreading” (Herein referred to as Vijaykumar).

10. Referring to claim 1, Vijaykumar has taught a method comprising:

executing corresponding instruction threads in parallel as a leading thread and a trailing thread [see 2nd and 4th paragraphs of section 1];

speculatively saving a result from a first instruction executed in the leading thread and speculatively saving a result from a second instruction corresponding to the first

instruction executed in the trailing thread to a memory having extensions for speculative storage *[see 4th paragraph of section 3.3];*

comparing the results saved in the memory *[see 4th paragraph of section 3.3];*

committing a single set of instruction based on the compared result *[committing trailing thread stores in the commit vector; see 5th and 6th paragraphs of section 3.3];*
and

deferring external updates until completion of the step of committing *[stores to external memory are deferred unit the trailing stores commit; see 5th and 6th paragraphs of section 3.3].*

11. Referring to claim 3, Vijaykumar has taught the method of claim 1 wherein the corresponding instruction threads are epoch instruction threads *[see 2nd and 4th paragraphs of section 1].*

12. Referring to claim 4, Vijaykumar has taught the method of claim 3, wherein a location read by the leading thread during an epoch contains same value as that read by the leading thread when the corresponding read by the trailing thread loads occurs *[see 4th and 5th paragraphs of section 3.3].*

Allowable Subject Matter

13. Claims 5-8 and 10 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

14. The following is a statement of reasons for the indication of allowable subject matter:

Claim 5 includes the limitation “a means for deferring external updates until completion of the step of committing”. Looking to the applicant’s specification for the details of the means reveals that the means for deferring is directed towards deferring updates (e.g. writes) *by agents external to the processor* until completion of the step of committing. The prior art of record, including the disclosure of Vijaykumar, has not taught or render obvious deferring updates by agents external to the processor until the completion of the step of committing. Vijaykumar has taught deferring updates to memory external to the processor (i.e. updates from local instructions), but has not taught deferring update by agents external to the processor. Therefore, Vijaykumar has not taught claim 5. Claims 6-8 and 10 depend from claim 5 and are considered allowable for the same reasons as for claim 5.

Response to Arguments

15. Applicant's arguments filed 09/07/2007 have been fully considered but they are not persuasive.

16. Applicant argues the novelty/rejection of the claims, in substance that:

“Vijaykumar does not disclose or fairly suggest this element [speculatively storing a value in a memory having extensions for speculative storage] of claims 1...” (page 4)

These arguments are not found persuasive for the following reasons:

Vijaykumar has taught storing results from first and second instructions in leading and trailing threads, respectively, in the store buffer (StB) [4th paragraph in section 3.3]. This storing is done speculatively [3rd paragraph of section 3]. Since the StB is a memory that stores speculative results it is a memory that has extensions for

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speculative storage. Therefore, Vijaykumar has taught speculatively storing values in a memory having extensions for speculative storage.

Conclusion

17. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin P. Geib whose telephone number is (571) 272-8628. The examiner can normally be reached on Mon-Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alford Kindred can be reached on (571) 272-4037. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Benjamin P Geib
Examiner
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ALFORD KINDRED
SUPERVISORY PATENT EXAMINER